

WHAT IS CLAIMED IS:

1. A communication method using directional beam for conducting communication between a radio base station and a mobile station by a directional beam generated by an adaptive array antenna having a plurality of antenna elements, the communication method comprising the steps of:
 - receiving an up signal from the mobile station;
 - measuring an elapsed time from reception of the up signal;
 - changing an antenna weight, which is a weighting factor for a signal for each mobile station to be inputted to the adaptive array antenna, based on a result of the measuring step; and
 - generating a directional beam pattern for each mobile station according to the antenna weight.
2. A radio base station for conducting communication with a mobile station by a directional beam generated by an adaptive array antenna having a plurality of antenna elements, the radio station comprising:
 - a beam pattern generator for generating a directional beam pattern for each mobile station according to an antenna weight, which is a weighting factor for a signal to be inputted to the adaptive array antenna;
 - a receiver for receiving an up signal from the mobile station;
 - a timer for measuring an elapsed time from reception of the up signal; and
 - an antenna weight changer for changing an antenna weight

based on a result of the measuring by the timer.

3. A radio base station according to claim 2, wherein the antenna weight changer changes the antenna weight so as to expand a coverage of the directional beam if the result of the measuring
5 by the timer exceeds a prescribed threshold.

4. A radio base station according to claim 3, wherein the antenna weight changer changes the antenna weight so as to expand the coverage of the directional beam in a step-by-step basis using a plurality of prescribed thresholds if the result of the
10 measuring by the timer exceeds each of the prescribed thresholds.

5. A radio base station according to claim 3, wherein the antenna weight changer changes the antenna weight so as to cover an entire sector in which the mobile station is located if the result of the measuring by the timer exceeds the prescribed
15 threshold.

6. A radio base station according to claim 2, wherein the antenna weight changer changes the antenna weight so as to expand the coverage of the directional beam if the result of the measuring
by the timer exceeds a prescribed threshold, and

20 the antenna weight changer further changes the antenna weight according to a prescribed algorithm if the receiver receives an up signal while the radio base station is expanding the coverage of the directional beam.